REMARKS

The foregoing amendments and these remarks are in response to the Office Action dated March 30, 2004. This amendment is timely filed.

At the time of the Office Action, claims 1-13 were pending in the application. Claims 14-20 have been withdrawn from consideration. In the Office Action, objections were raised regarding the specification and abstract. Claims 1-13 were objected to for minor informalities. Claim 13 was rejected under 35 U.S.C. §112, second paragraph. Claims 12-13 were rejected under 35 U.S.C. §102(b). Claims 1-6 and 9-11 were rejected under 35 U.S.C. §103(a). Claims 7 and 8 were rejected under 35 U.S.C. §103(a).

I. Election/Restriction

Applicant respectfully disagrees with the Examiner's comments on the restriction requirement and Applicant's subsequent arguments, and maintains the traverse of the restriction requirement and request for reconsideration thereof. The claims are linked by a single inventive concept, and all claims share a special technical feature in accordance with PCT Rule 13.2, which is the separation by density of particles having a density lower than that of the surrounding medium. In accordance with 37 CFR §1.144, Applicant retains the right to defer a petition on the restriction requirement until after final action on or allowance of the elected claims.

II. Objection to the specification and abstract

In the Office Action, objections were made to the specification and abstract. Amendments are made herein to add section headings to the specification, and the language in the abstract has been amended. Withdrawal of these rejections are therefore respectfully requested.

III. Objections to the claims

Claims 1-13 were objected to for minor informalities. Applicant has amended the claims to overcome the objections. Withdrawal of the objection is respectfully requested.

IV. Claim Rejections under 35 U.S.C. §112

Claim 13 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the phrase "preferably" recited in claim 13 was asserted to render the claim indefinite. Applicant has amended claim 13 herein to overcome this rejection, and has introduced new claim 21 including the feature removed from claim 13. Withdrawal of the rejection is respectfully requested.

V. Rejections on Art

Claims 12-13 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 2,708,032 to Heyman ("Heyman"). Claims 1-6 and 9-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Heyman in view of German Patent No. 4304726 to Siebert ("Siebert") and U.S. Patent No. 4,119,533 to Saitoh et al. ("Saitoh"). Claims 7 and 8 were rejected under 35 U.S.C §103(a) as being unpatentable over Heyman in view of Siebert and Saitoh as applied to claims 1-6 and 9-11, and further in view of U.S. Patent No. 5,361,910 to Yang et al.

Turning first to the rejection under 35 U.S.C. §102(b), the apparatus according to claims 12 and 13 differ from the apparatus disclosed in Heyman. Claim 12 recites an element defining a first portion of a separation chamber (below the element) and a second portion of the separation chamber (in general above the element; see Fig. 3). If the element is moved up and down relative to the wall of the separation chamber, the volumes of these portions change. Claim 12 further recites a supply opening and discharge openings in direct communication with each other via the first portion. Thus, the discharge openings are not on opposite sides of the element, which is in stark contrast to Heyman.

Moreover, Heyman does not teach or suggest an apparatus suitable for separating particles differing in density (Heyman separates mica particles differing in thickness), nor separating particles having a density lower than that of the surrounding medium. Based upon the foregoing claim 12 and its dependent claim 13 are in condition for allowance.

With respect to the rejections under 35 U.S.C. §103(a), the prior art does not teach or suggest the introduction of particles to be separated below the element, such that a barrier is present above the particles, as recited in claim 1. Siebert's process relies on separation by floating and sinking, as one type of particle has a density lower than that of the surrounding medium, and the other type has a density higher than that of the surrounding medium. For Heyman, mica particles are separated and the particles do not differ in density. Also, the particles to be separated have a density higher than that of the surrounding medium. In contrast, in claim 1, the particles to be separated have a density lower than that of the surrounding medium. Thus, the combination of Heyman and Siebert does not teach that which is recited by claim 1.

Saitoh states that "since plastics have similar specific gravities and other physical properties, it has been virtually impossible to separate a plastics mixture into the individual types of plastics" (see column 1, line 15). A person of ordinary skill in the art would have no incentive to base the separation of particles on density in the first place, and would have no reason to combine it with Heyman, which addresses the separation of particles having identical densities but differing in thickness, which is not suitable, as previously discussed. Notably, Saitoh separates based on hydrophobicity, not density. As both Heyman and Saitoh do not separate based on density, they do not teach or suggest the method recited in claims 1-11.

Yang uses a settling bed. Of the particles separated by the Yang invention, one has a density lower and one has a density higher than that of the surrounding medium. Yang does not teach the separation of particles where all the particles to be separated have a density lower than the surrounding medium.

For the foregoing reasons, claim 1 is believed to recite patentable subject matter and to be in condition for allowance. The claims dependent upon claim 1 are also believed allowable because of their dependence upon an allowable base claim, and because of the further features recited.

V. Conclusion

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. Nevertheless, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicant respectfully requests reconsideration and prompt allowance of the pending claims.

Respectfully submitted,

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